

AVIATION

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Major de Bernardi and his Italian Macchi-Fiat after winning the Schneider Cup

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SPECIAL FEATURES

NUMBER
21

THE SCHNEIDER CUP RACE
COMMERCIAL AVIATION IN THE NATIONAL DEFENSE
THE WESTBURY LIGHTPLANE CLUB

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AVIATION

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Italy's Splendid Victory

WHAT WAS in many respects the greatest seaplane contest ever held was the race for the Jacques Schneider Memorial Cup last Saturday at Norfolk, Va., in which Italy defeated the United States in a masterly race during which many seaplane speed records were shattered by both the Italian and the American planes. Major Mario de Bernardi, who won the trophy, swept the trophy at an average speed of no less than 246.495 m.p.h. in a splendid race, but his success was not purely his own. It was the result of the concerted efforts and untiring energy of the entire Italian team, from mechanics upwards, who came to this country with three almost custom-made planes which were very costly as compared to the Italian ones they were to challenge when we first set eyes upon the beautiful lines of the speedy little Maestri Fiat machines.

Italy was because her planes were aerodynamically faster than were ours, her engines were more powerful, and her pilots, among the finest in her country, and her mechanics, together worked in unison as one body. Her team work was remarkable and had become a most noticeable feature to everyone who went to Norfolk for the race. These accomplished masters all worked together to speed means to her team and the Italians now prepare to carry back to Italy a trophy which they came over to win and which they will now undoubtedly guard with justifiable pride.

From the American standpoint, the Schneider Cup contest has not been lost without any losses being incurred, the value of which will depend entirely upon the extent to which we learn these lessons. As many respects it may be said that the United States has been beaten at her own game. The country has held the World seaplane speed honors ever since Lieutenant R. H. Lawrence first captured the Schneider Cup from the British at Cowes, England in 1903. Her challenges for these honors have not failed her, nor with much success. Possibly, she has been led to make into the misapprehension that we need no special effort as our own past in order to build the machine, and that the development of our new seaplane this year would be sufficient to defeat success fully all challenges.

But there is more to it than this. Our branch of our aeromarine obviously must be entrusted with the defense of our harbors in the air. Last year the Navy's contribution in the Schneider Cup contest, quite apart from the fact that she did not win, were a failure. This year conditions were even worse. The Navy boats upon the Schneider Cup contest as a means of testing her personnel, as was characterized by the fact that two of our best racing pilots, Harry Gray, and a pilot of unquestioned ability but with little or no racing experi-

ence was permitted to wash out of our best planes and narrowly escape with his own life. To win in the future the personnel of both Army and Navy must be made available.

All this points strongly to the fact that it is in private enterprises that we must expect the greatest success. The Italian Air Department, under the direction of Piosimo Biondini, ordered the three Maestri racers but left the development of the planes and the management and organization of their national effort in the hands of private enterprise. The race organization was in the hands of the Maestri and Fiat concerns whose products were at stake. Their men worked in unison. As already mentioned, their cooperation was remarked on by everyone. Italy was the Schneider Cup because of the keen determination of private enterprise to gain this coveted prize, bought with its money the international prestige in the air which it gained on Saturday when its subjects put up a remarkable performance.

The United States was, and probably will eventually, do likewise. Some indication of the success which may be gained from the encouragement of private enterprise is seen to be found in the details of our own program, now for the Schneider Cup contest. Two of America's chief aircraft engine manufacturers were to have had their respective power plants in the race. The Curtiss company was awarded a bid to build the engine for the new Curtiss V-1550 engine in the B-14, while a bid to install and adjustment of the Packard 1A-1600 power plant in the B-14 was made to the Navy. What actually happened was a strong leaning upon the second alternative. The B-14, as the hands of the Curtiss company, was being extremely tested some time before the race. Little real trouble was experienced with the plane and engine, while it remained in the hands of the Curtiss company. On the other hand, modified World seaplane speed records were set up during the test flights of the plane.

Now, take the case of the Packard engine placed in the hands of the Navy. Little was heard of the machine and no details of any kind were forthcoming before the contest. No results of test flights were announced and it is known that considerable trouble of one kind and another was experienced. Yet the Packard 1A-1600 engine is a most power plant which is in constant service and has proved itself in one of the very finest high powered engines in the world. Hence, there may be combined the two positions in procedure. Which should we choose in the future?

We need to win the Schneider Cup back from Italy. We need it for our international prestige in the air and we need it as a stimulus of our technical development in aeromarine. Considerable thought, however, should be given to the method of our organization in the future.

The Schneider Cup Race

Italy Wins the Jacques Schneider Trophy at Record Breaking Speed

UNUSUAL perfect weather conditions and record by crews estimated at 30,000 people, Italy won the 1935 Jacques Schneider Cup race on Saturday, Nov. 14, at Hampton Roads, Va., when Major Mario de Biondini, captain of the Italian team of three planes, flew his March-Fiat racing airplane seven times around the 50 km. triangular course at an average speed of 243.496 mph. As in last year's Schneider Cup contest, when Louis J. Bl. (Australia) flew a small biplane race in the Curlew RSC-2 course, so this year, Major de Biondini, in even more startling fashion, broke at least two World airplane speed records when he opened the 200 km. (124.453 miles) course in a total elapsed time of 52 sec. 56.22 sec. When it is recalled that the entire airplane speed record over the 3 km. straightaway, as set up by Lieutenant Desbriere last year, is 243.775 mph, the real significance of Major de Biondini's performance will be realized. So he covered the entire 200 km. distance at the race, including no less than twenty one turns, at a speed which shattered Lieutenant Desbriere's World record. Furthermore, Major de Biondini actually broke the strong Maingy record on each of his seven laps of the 50 km. course since the first one, during which, apparently, he did not let his engine cool fully.

Comparison With Last Year's Figures

An limited amount of Major de Biondini's performance during the race, compared with last year's contest, is given hereafter:

	1935, Va. (Schneider) pilot Major de Biondini	Average
50 km.	52.157	243.775
100 km.	104.314	243.775
200 km.	208.628	243.775
500 km.	522.171	243.496

The new record of 243.496 mph. for the 200 km. supercharged a comparison of Major de Biondini's fifth and sixth laps. He also flew two other laps—the third and fourth—at an average speed of 247.815 mph. which, in itself, was a record. The 200 km. record itself was made during the third, fourth, fifth and sixth laps together.

Against one record alone in the race when Louis Desbriere, French held, 11.8 sec., flying the RSC-2, last year's winner of the Schneider race, at an average speed of 232.383 mph., so many that one mile per hour slower than the same plane made at last year's contest. It should, however, be remembered that this year's course had far very sharp corners in it and that the reduced average speed was due rather to what may be

termed a "short corner" than to any deficiency in piloting. Lieutenant Desbriere's course was very slightly negotiated with the maximum loss in speed. Lieutenant Desbriere's elapsed time for the race was 56 sec. 52.96 sec.

Italian Plane Holds Rank

Third place in the finish went to Lerch, Austrian, flying the Italian team, flying the March-Fiat monoplane No. 1, at an average speed of 233.806 mph., with an elapsed time for the course of 56 sec. 51.29 sec. This apparent marked reduction in the speed of Lieutenant Desbriere's machine, which was identical in every respect with that of Major de Biondini, was due to the fact that Lieutenant Desbriere had been instructed to fly the entire race with his engine partially throttled in order to reduce the possibility of his experiencing engine trouble which might have the other two planes of the Italian team out of the race. The object in view was to maintain one Italian which would almost certainly break and might even be a winner in the event of the other Italian planes or the American machines being forced down and would certainly prevent the last altogether possible possibility of the Curlew (Hawthorn) flying by Lieutenant Desbriere, winning due to trouble being experienced by all the other contestants. It developed after the race that Lieutenant Desbriere's speed was somewhat slower than he had reported but it made no difference to the results of the contest.

Lieut. William G. Tomlinson, U.S.N., flying a standard American Curlew Hawk airplane in place of the Curlew-Parkard plane which was crashed the day before the race, very narrowly finished fourth and last with an average speed of 136.853 mph. and a total time of 1 hr. 35 min. 50.75 sec.

The race itself was without unusual incident with the exception of the falling out of two of the planes, one American and one Italian entry. At the end of his third lap, Capt. Arturo Ferraris, flying plane No. 2, was forced to land owing to a break in the end of the engine of his March-Fiat airplane. Told that he had been ordered to average speed of 238.705 mph. for the 150 km. which he completed. His speed, as things developed, would have, in all probability, also set a new record in the world but he landed, for his country, continued, Capt. George T. Coddie, U.S.N., flying the RSC-4 Curlew V-2500 against him, made only 237.762 mph. over the first 150 km. of the race. Lieutenant Coddie, however, who also failed to return from the race when, he was about

to break his seventh and last lap, the greater supply in his engine was cut off through the pump which brought fuel up from the position taken falling to twelve. His engine, though operating perfectly throughout the entire 200 km. and some which he covered, ran dry as he was on the last lap. His seventh lap and Lieutenant Coddie was forced to finish in the dropping hour of Hampton Roads where he was later taken to a hospital room. Then, the prize which represented America's greatest hope of defeating the Schneider Cup, though already subjected to Major de Biondini's airplane, was forced out of the contest by what was only to be expected as a minor trouble in spite of the drastic result which it had. Lieutenant Coddie would have been a close second had he finished.

The Start of the Race

The race itself started to schedule without incident. People began to collect on the flying field at the Air Station of the Navy Operating Base, at Norfolk two or three hours before the time set for the start. The house prize, awarded on a basis, had been moved to a point approximately 300 yd. off the Northwest corner of the flying field which was right to the water's edge and in built up with a straight line first drop to the center of the water. Right on the Northwest corner of the field the three's stand had been erected with a new board for the recording of lap times. Here, Otto A. Packer, of Indianapolis, had mounted his extremely delicate timing instrument consisting of an electric chronograph which is capable of measuring to 1/100th of a second. Here, too, the local collecting committee was ready for collecting, as quickly as possible, the time and distances in kilometers to

winners per hour speed. The grante and public spectators were arranged such that everybody had a good view and, judging from the number of automobiles and people which crowded the sidewalks, almost to the waterfront, air race had reached a high degree in Virginia. In addition, large crowds were reported to have collected at Mergent Ferry, one of the largest points in the 24 km. straight leg of the course.

Owing to a last minute change in wind direction, instead of the planes leaving out from the "head", as the starting signpost of the Air Station were called, and taking off directly or front of the spectators and between the latter stand and the pylons, it was necessary for a new imaginary starting line to be arranged between a mark back and the latter's stand, allowing the spectators to take off directly from the "head" and continue straight off on the first leg of the race. This arrangement was somewhat unfortunate since it effectively prevented the majority of the spectators from witnessing the take off of each plane, which was normally one of the most interesting features of the contest.

Service Airplane in Background

Shortly before 9:00 p.m., the official time set for the start, a small DSS-4 service flying boat, known as a "five day" at the Naval Base, set out to patrol the center of the course so as to be in constant view of the racing machines and be in a position to render assistance if any one when such might be necessary. These machines are fully equipped with fire-fighting apparatus and automatic, and, as was demonstrated earlier in the week when Captain Ferraris' machine crashed in during a test flight, are able to render valuable service



The winner. The March-Fiat M-F monoplane in which Major de Biondini set up an average speed for the 200 km. of 243.496 mph. in the Schneider Cup Race.



From right wings at flight during the Schneider Cup race. 1. Lieutenant Coddie going up in the RSC-4. 2. Major de Biondini covering the finish line winner of the trophy at 243 mph. 3. Desbriere Tomlinson. 4. The Prater's standard RSC-2 going ready to take the alternative flight. 5. Major de Biondini winner of the Schneider Cup. The RSC-4, with Lieutenant Coddie on the engine about to start in distribution trials on Friday, 6. The RSC-4 being tested in its attempt for the water balloon test. 7. Lieutenant Tomlinson flying the Curlew Hawk just before again.

in passing a fire extinguisher to the pilot of the stricken plane and in rescuing other folk. This Sikorski boat remained out during the fifteen minutes, starting again and again. It was the only of the triangular course as to be out of the way of the many planes left, at the same time, as a position to view their progress at all times.

First Run Off

Lieutenant Bonds began warming up the engine of his Mohr 700 plane, No. 3, at about 10:30 p.m. and he taxied down the drome at approximately 2:30 p.m. when he taxied rapidly across the starting line, which had to be passed on the right, and quickly climbed out into the air. The actual take-off took from 20 to 30 seconds, which was about the time taken by all three of the Italian planes while the American runner took a little longer than this to leave the surface of the water. Another interesting feature of the take-off of the little Maude seaplane, of 1000 cc. of which was about 100 cc. in excess, required was the very smooth manner in which they made the water in high speed and this responsibility would demand of spray set up. Of course, there is a very considerable disturbance and every time any object comes through water at a speed of anything from 60 to 80 m.p.h., the propeller of a plane, still being responsible for becoming a considerable source of water disturbance. The American runner, the Italian seaplanes were very steady indeed during the taking off, the most noticeable feature being the entire absence of the somewhat violent pitching motion characteristic of the take-off of the American.

The second plane to leave was the Curtiss Hawk piloted by Lieutenant Tomlinson, who crossed the starting line at 2:40 p.m. Shortly after leaving the water, Tomlinson's plane left Bonds' Italian seaplane into the air for an on the horizon, spending about the 24 mile kilometer straight line of the course in the direction of the Newport News runway plane. The next plane due to leave under the schedule of one minute starting every five minutes, was No. 3, the Maude, runner piloted by Captain Ferreira, who, supposedly was having some trouble in warming up his engine. There was some delay and waiting for Ferreira, London at 2:50 p.m. No. 3, the all-Italian BSC-4 plane with the 700 hp. Curtiss V-1000 engine, started off across the starting line and took off shortly after the Curtiss Hawk. The Curtiss Hawk took off, one minute after Bonds had left. Ferreira's Maude, took off. By this time Lieutenant Bonds had completed his first lap at an average speed of 230.594 m.p.h. and he crossed the starting line at 3:00 p.m. The next time that he was in the air was at 3:05 p.m. when he was not among spectators near Lieutenant Bonds' Italian seaplane of last year. For some reason, however, even at this time of the plot to have Lieutenant Bonds' boat and his speed and the Curtiss Hawk's speed. Lieutenant Bonds' boat completed his first lap at 2:50 p.m. at an average speed of 104.731 m.p.h. and was quickly followed by Lieutenant Tomlinson in the BSC-4 at 2:51 p.m. at an average speed of 230.897 m.p.h.

Bonds' boat in the second lap ran 233.412 m.p.h., about four miles per hour faster than his first circuit. But real comparison can be made only when the boats are in the water. The "Hermes" third, T. J. Henderson of Indianapolis, who has a very big thunder through the magnificent, announced Captain Ferreira's first lap at 2:54.631 m.p.h., at about two miles per hour faster than the speed of the BSC-4, Tomlinson's first plane.

The Italian Captain Leaves

Major de Bernatchi, captain of the Italian team, took off at about 3:30 p.m. and he followed a similar line to Lieutenant Bonds of the Marine Corps, flying just under the horizon. The Curtiss BSC-4. Almost at the same time, Captain Ferreira returned on the start of his third lap flying at about 260 m.p.h. and straggled out from the subsists of his plane, which was a feature characteristic of such of the other machines. Brought on his second lap, Lieutenant Bonds' speed was checked at 230.180 m.p.h., which meant the end of the American seaplane. It was four miles per hour faster than the speed he had made on his last lap.

However, when Captain Ferreira returned on his second lap it was found that he, too, had averaged a good average for the first 200 laps, by about four miles per hour, his average being 230.180 m.p.h. And it was in this manner that he maintained and continued under the speedometer.

However the first real information of the race being at 3:30 p.m. was given when Major de Bernatchi completed his first lap at a speed of no less than 230.412 m.p.h. was checked up on the race board. In the meantime Lieutenant Bonds was averaging his speed average by about one mile per hour on each of his numerous laps, while Lieutenant Bonds was making around 230 m.p.h.



Major de Bernatchi being awarded double high from his plane after his victory in the Schneider Cup race. Spago Major Bonds, captain of the Maude seaplane, left to see in his return left with a first place in the Curtiss Hawk. Italian side of Atlantic.

At the conclusion of his third lap, when he had done 245.408 m.p.h. on his 120 m.p.h. in his third lap and when he had actually made 233.412 m.p.h. in his second lap, Captain Ferreira crossed the line with his engine obviously not operating satisfactorily. The reason and good powers which had characterized the success of the Italian team from the day of its arrival in the country was again evident as Captain Ferreira left the course and climbed out beyond the horizon, making around and into a landing on land with his engine taking over. It developed that an oil leak had broken, with the result that his engine was not lubricated well, rather than the usually satisfactory motor. Captain Ferreira had retired from the race with his engine and since oil in good condition. He landed at about 3:45 p.m. having been in the air a total of 39 min. 37.2 sec.

The next time, with Major de Bernatchi doing 244.946 m.p.h. as the average for his first three laps and Captain Ferreira at a 245.408 m.p.h., it looked very much as though first and second place in the race were going to Italy. The retirement of Ferreira, however, left Lieutenant Bonds in the running for the second place and first, in the event of a second de Bernatchi's engine trouble and so his team made his end. Up to the fifth lap, Lieutenant Bonds had done an average of 230.750 m.p.h., his speed for the fifth lap half hour as high as 242.180 m.p.h., the highest speed set up by the American team in the contest.

It was very noticeable how very much under the Italian team. Bonds the team under them were the American pilots. All three American pilots did enough the Italian pilots, who was the widest, and therefore, second place in the course, made out, between the second third and the fourth. Lieutenant Tomlinson, in the Hawk, naturally making slower than all the others. But the Italian pilots chose to do very well all the time and in some cases were probably 20 m.p.h. or so from the Italian. It is notable, in fact, that Major de Bernatchi's speed for the entire night has been very much higher than he first, down it.

In the meantime, Lieutenant Bonds was coming around completely, his average speed up to 231.177 m.p.h. on his sixth lap. He had sailed single lap with No. 4 which he completed at 231.033 m.p.h. However, Lieutenant Bonds had failed to return at the end of his seventh lap and, facing a strong, strong 200 m.p.h. wind and so in the direction of the Italian team, where they quickly reach Italy.



Who Would Have
A series of the crowd which waited the Schneider Cup race from the flying field at the Naval Base, Norfolk, Va.

In the BSC-4 plane, coming about with a dual engine, the reason for which has already been given, and took his last lap. Cuddley came down at approximately 2:45 p.m., in his time in the air 39 min. 50.5 sec. Meanwhile, Lieutenant Bonds, the first to start, had finished the race at an average speed of 230.800 m.p.h.

A close examination of Major de Bernatchi's announcement average speed which he had probably increased his lap to 245.408 m.p.h. on his third lap, in his second lap, was 245.408 m.p.h. On his fourth lap, in his second lap, he was 245.408 m.p.h. On his fifth lap, in his second lap, he was 245.408 m.p.h. On his sixth lap, in his second lap, he was 245.408 m.p.h. On his seventh lap, in his second lap, he was 245.408 m.p.h. On his eighth lap, in his second lap, he was 245.408 m.p.h. On his ninth lap, in his second lap, he was 245.408 m.p.h. On his tenth lap, in his second lap, he was 245.408 m.p.h. On his eleventh lap, in his second lap, he was 245.408 m.p.h. On his twelfth lap, in his second lap, he was 245.408 m.p.h. On his thirteenth lap, in his second lap, he was 245.408 m.p.h. On his fourteenth lap, in his second lap, he was 245.408 m.p.h. On his fifteenth lap, in his second lap, he was 245.408 m.p.h. On his sixteenth lap, in his second lap, he was 245.408 m.p.h. 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cartridges were made during the War, the bullets of which weighed from 500 to 700 yards with a slight light flight.

The desired effect was produced by inserting a chemical composition under high pressure into the hole of the bullet and this composition ignited as the bullet was started by the cartridge powder charge and produced a light that the pilot or gunner could see during the flight.

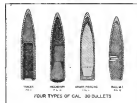


Fig. 9, 30. II. 12

During the War, tracers were made to give a greenish-white light but experiments were also conducted which resulted in tracers of various colors including a distinct red. It was later found that red was the most satisfactory color as it did not blend with the colors in the sky and, therefore, gave a more clearly defined trace. This color has recently been adopted as standard. The new composition gives a trace of about 1500 yards. Experiments are being continued on all types of tracers in an effort to improve them wherever possible.

Tracer cartridges are loaded into the ammunition belts for machine gun use in the proportion of one tracer cartridge to four other cartridges. Every fifth bullet will, therefore, indicate the path of flight of all bullets being fired by the machine gun. There is no fixed rule as to the distribution of tracers in the machine gun belt as some find this more than one in ten, while others prefer less.

The secondary ammunition has a bullet filled with white phosphorus and its primary use is against observation balloons. This cartridge was not designed for aerial use as it would produce either an intense smoke and smoke rising

with fragments loaded with secondary cartridges generally served alone to attack the enemy's balloons so that in case of capture they would not be charged with using the ammunition for selfish purposes against personnel. The bullet jacket was made in the usual pattern form and the white phosphorus pellet was then inserted. In the rear of the phosphorus were two lead plugs to balance the bullet and produce the seal at the rear. The end of the bullet jacket was then spun over and had solder used to seal the base. A small hole was passed through the bullet jacket opposite the tapered part of the rear lead plug. This solder was melted into this hole. The bullets were then given a heat treat to insure that there were no leaks after which they were loaded into cartridges. See Fig. 13.

When the bullet was fired its friction against the muzzle gas barrel produced sufficient heat to melt the soft solder from the small hole and release the phosphorus in a molten state. As soon as the bullet moved from the barrel, the molten phosphorus was expelled from the hole in the jacket due to centrifugal force and began burning immediately on contact with the air. The bullet carried its secondary projection from 600 to 550 yards after which the phosphorus was gradually burned out. The secondary bullet was first made with a lead nose and it was expected that this type gave better results against balloons. This type was never in actual service with these changes of the development as there was maximum strength of machine guns with this bullet. This type was afterwards changed to the bullet with pointed nose.

Armor Piercing Ammunition

As armor plate came into use for the protection of personnel during combat, it became necessary to develop ammunition which would penetrate the plate and destroy its effectiveness. Bullets of various design have been used by our aerial forces but the fundamental principle of such is the same, i.e., the use of a steel core inside of the bullet.

The steel core is hardened and tempered to give the proper degree of hardness to cause penetration without shattering. It should weigh at least 50% of the weight of the entire bullet. The core is inserted into the bullet jacket in one of several shaped lead alloy and the bullet is sealed with a lead alloy plug to prevent the high-pressure gases from escaping the bullet apart as it is fired. The armor piercing ammunition should readily penetrate 30 armor plate of 600 yards. These cartridges are interpreted with tracer and ball cartridges in the aerial machine gun belt. The tip of the bullet is blackened to distinguish the cartridge from other types. See Fig. 11.

Ball Ammunition

During the war, ball ammunition was the same as used by the ground troops except that it was manufactured and inspected more strictly, packed, and marked differently. The bullet was the standard 150 grain type with pointed nose

and hit into which was fired at a muzzle velocity of 2700 ft. per sec. This cartridge was modified for aerial combat but was designed for use as machine gun, heavy firing. After the Armistice, great progress was made in the development of a new service cartridge having greater range, accuracy and more striking energy. The new cartridge fired a bullet of the ballistics type weighing 372 grains at a velocity of 2700 ft. per sec. It has an effective range of 4500 yards while the old cartridge only scored about 2400 yards. See Fig. 12. Many other cartridges have been designed for special purposes but will not be described here as some are of a confidential nature.

Bombs

Commercial success of the heavier type could readily be adopted for use as bombs provided consideration was given to methods of carrying bombs and the strength of the various members designed to carry the load. In addition, it is highly essential that questions be made of the structural part as to the design of the bomb, as the latest design goes into the bomb right being attached to the rear of the plane at the extreme forward end of the longitudinal axis of the



Fig. 21. Bombing Bombs

forebody in such manner as to give unobstructed views from vertically downward to horizontally forward. The importance of the location of the bomb's eye is especially important in the questions relating to sighting and the release of bombs in bombing runs and must be evident and should not be overlooked.

There are three types of bombs used by our Air Corps, namely, the Fragmentation, Description and Chemical Bombs. The fragmentation bombs are of light weight known as the 15 lb. Mark II and the 25 lb. Mark III. These are the first general use against personnel and are designed to give a great mass of fragments when the bombs detonate. These bombs can be carried by racks mounted on the underside of wings of the airplane. They are generally dropped by fuel jettison planes which sweep down upon the troops of the enemy, dropping the bombs and then coming out of danger.

The description bombs are made in various weights from 100 to 2000 lb. The principal one is used by our Air Corps are the 100 lb., 500 lb., 600 lb., 1750 lb. and 2000 lb. These bombs are of greater weight have been produced but not adopted as a standard for manufacturing. The description bomb is most primarily for bombing railway sidings, ammunition dumps, gas houses and munitions areas, fortifications, etc. These bombs are loaded with high explosives and the bomb shell is generally made to this to provide for a maximum amount of explosion for a given weight. The later bombs of this type can be carried by racks attached to the wings of the airplane but as a rule they are carried by auto-lift into the fuselage of the plane. When loaded as the ordinary bomb rack built into the fuselage of the airplane, it is a flat, as in place, or very rapidly, it is a bomb rack. The main use of the description bombs is the bombs which are used to explode on impact, are armed in outer fuselage.

tion on impact as may be desired. The bombs are generally equipped with a nose and tail fuse to cause a bursting effect of the description bombs used by our Air Corps is shown in Fig. 13. A bomb designed to carry twenty 180 lb. bombs and suitable for mounting in the fuselage of the Martin Bomber is shown in Fig. 14.

Chemical bombs of varied types have been developed to produce secondary and smoke screen effect upon impact. The secondary type had been made according to two designs, one of which contains the secondary mixture, while the other contains the secondary material to produce an intense heat in one particular spot. Bombs loaded with smoke producing



Fig. 14. Bomb Rack for 300 lb. Bombs

materials have been designed to give a screen effect to conceal movements of troops or ships. The secondary bombs are carried with nose and tail fuses and are carried in bomb racks similar to the fragmentation and description bombs.

In Conclusion

We must not lose sight of the military value of a great commercial air force. In the instance of our aerial and service and other commercial enterprises, the adaptation of these planes to military service should be not of the consideration in their design.

Military aviation is indeed on the threshold of a new era and it is an opportune hour for all of our aviation communities in the realization of commercial aviation in our own country. Let us look into the future and not find ourselves unprepared in the latest of modern methods of warfare in new we are unprepared enough to have another great emergency.

Prof. O. H. Besquin Joins Haskelite

Prof. O. H. Besquin, who has been consulting engineer in the Haskelite Manufacturing Corporation since its organization, has resigned from the staff at Northwestern University, with which he has been associated the twenty-five years, to take charge of the engineering department of our company. Professor Besquin's research work in the field of strength of materials and his experiments with the fatigue-phenomena of metals has him in most this problem in connection with the production of steel. His researches have been in the field of strength and the phenomena of physical in the field of strength will be one of the important problems which he will help to solve. During the War, Professor Besquin conducted extensive study on fuselage construction and he will be in a position to undertake studies of this character for the Haskelite Company whenever the opportunity offers.

Unique Aviation Record

A novel aviation record was recently made by Lieutenant Thuret, the French pilot, when he carried food and other material and a French aviator in a biplane over the Alps. The noted French pilot made this one successful flight in the top of Mont Blanc, which is 15,780 ft. high, between Oct. 16 and 21.



Fig. 8. Four-Engine Biplane, Mounted on Army DHT-4

The Westbury Lightplane Club

A Practical and Active Flying Club Organized in the East

WHERE AMERICA is probably the greatest country in the world for stunts, there is one activity which has failed so far to gather a train of activities in its wake, and that is aviation. There have been half-hearted attempts here and there to form amateur organizations for the purpose of studying the principles of flying and the designing of airplanes, but there has been no serious and sustained attempt on the part of persons to master the art. At least that was true until six weeks ago.

Encouraged by the success of light airplane clubs in Germany, France, and England, four Westbury young men got together, Aug. 24, and organized themselves into the Westbury Light Plane Club. The first official meeting was held last day, and on Sept. 12, a plane was brought with money raised at a fund-raising tea and put in operation at the Bethany Flying Field, a few miles South of Westbury. A capable instructor, perhaps, but ignorant as to the light of the rapidly growing interest in aviation as a practical and commercial enterprise. As far as can be learned, the Westbury club is the first organization of the sort in America to own and fly its own plane.

Object of the Club

The purposes of the club as outlined in the constitution are: To promote interest in aviation, particularly as it applies to helicopters; to disseminate the knowledge of aeronautics by means of speakers, literature, and instruction for the teaching of aerodynamics; to aid in the advancement of aviation by lending support to all branches of aeronautical activity; to foster new developments in aeronautics; to give the members practical experience in the maintenance and flying of airplanes, and to engage in helicopter activity by designing, building, and operating helicopters.

The Westbury club has a very extensive program, and has the advantage of coming to place itself at the beginning of the aviation era, with the fundamentals of the art of aviation, with wealth, study of aerodynamics and the theory of flight. The club meets every Tuesday night and its three hours pass diligently through the foundation studies of the art of flying. Later, it is planned to have members and open courses. But at present, the members are more intent on learning how to fly than on making a sensation.

Practical Experience

Along with the study of the theory of flight, is the opportunity to learn first-hand from actual experience with a plane how the theory is applied. The plane owned by the club is a

JNA, about six years old, but equipped with a new Curtiss OXA, 80 hp. engine. The plane makes a maximum speed of about 70 m.p.h., and will carry two persons.

Since the formation of the club, the plane has been in the air almost every day. The members, among whom are two licensed pilots, go down to the flying field every night after work, Saturday afternoons, and all day Sundays. They rolled up a record of 30 flying hours in less than a month. When the plane is not in the air, it is receiving the careful and loving attention of its guardians, who aspire to be designers and builders of airplanes as well as pilots.

Plan to Build Plane

The aim of the club is to design and build a lightplane of its own after the members have learned enough about aerodynamics and aircraft construction. But it is a long way from the first principles of aerodynamics to the final production of a plane that will fly a path, however, which the Light Plane Club is following steadily and consistently. It is their hope, of course, that other clubs may be formed in all England with the chance for competition and inter-club meets.

There are four charter members of the club, the four in whose it occurred two months ago to start something that was venturesome in the extreme and held no definite promise of success. They each paid \$500 as an initiation fee, the money being used to purchase the plane, which was put at launch through a holey trail of events. Several accidents, with substantial privileges are scheduled on a 100 membership fee.

Orrin Crocker was the moving spirit in the organization of the club and at present is the instructor in aerodynamics. He is a graduate of Worcester Polytechnic Institute and at present is with the Westbury Iron Works as a mechanical engineer. Flying is a hobby with him, acquired during his school years.

Stephen B. Kelley is at present a student in Massachusetts Institute of Technology, and has been so for the last seven years, now he was 15 years old. He attended the Curtiss school of flying on Long Island for two years and has done much exhibiting work. He obtained a pilot's license three years ago and is the club's first instructor.

By Irving Jovan is a member of the third division of the Connecticut National Guard, and is known to fly. Ralph W. Butler has had no experience. The third student later on a full member and at present helping with instruction. It is known as the Westbury machine as the air around it is clean, smooth, glowing from brilliant and airplane body, and has had many years experience in flying.



The Jany biplane in the Westbury Lightplane Club

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The Pitcairn Orowing

A Three-Seater Sport Plane With OX-5 Engine

THE OROWING was designed as a low-priced sport plane which could also be used for passenger carrying and for primary instruction in operations the airplane features. The control stick and rudder bar in the front cockpit with their connections are readily removable, very quickly converting the plane from a training plane to a passenger carrier. The original arrangement was to build a steel tube fuselage for the Curtiss Oriole and this has been kept in mind throughout the design.

Fuselage

The fuselage, like that of the predecessor, the Fleetwing, is of trapezoidal section, the longer of the two parallel sides being at the top, and is welded up of 1805 steel tubing. The Pratt type of bracing is used for the upper and lower longerons, and the Warren type to connect the two. The engine mount is welded integral with the fuselage, and the engine bearings are of spruce and are to maintain the fuselage from engine vibration. The fuselage tapers at the rear to a tapered V, to which the fin frame is bolted. To the lower end of this V, a short steel strut is fastened to protect the rudder in case of damage to the tail wheel.

The landing gear is of the V-type with fixed axle and is of all-steel construction. The wheels are made of 1805 chromalloy steel tubing, and follow the design of the Oriole too. One license Martin are well to bolt the run to the fuselage. The wheels are 20 x 5 and are fitted with standard spacers.

The tail end is made of round steel tubing and is being on a fixed mount. The shock absorber is wound on two end-chamber spools which are readily removable by taking out a single bolt, which also takes the shock away. The tail end is removable upon withdrawing the pivot bolt, and the entire tail end section can be taken out by inserting two additional bolts. The door is a manganese bronze casting to secure long wear.

Wing Details

Almost the entire wing structure of the Oriole is made of the Orowing, the components being the rubber struts and the wing struts. The rubber struts are of stainless steel tubing, and the interplane struts will be of that material when the second

supply at steel struts is obtained. The wing struts are welded entirely, being drilled unnecessary. The cut-out in the upper wing at the center line being 30 in., adding about seven sq. ft. to the area, and the gas tank has been taken out of the center panel. Head rails are used throughout for wing bracing, the flying wires being double and the tension, single. The wings are set at 2½° incidence and 1½° dihedral, with a stagger of 14½ in. and a gap of 60½ in.

The Oriole controls are modified somewhat for the Orowing. The stick control seat is positioned in the same, the topgrip tube and the lower stick being shortened. The control from the control seat on the longer tube instead of running along the rear of its lower wing to a horn on the lower ribbing, is fed along the top surface of the lower wing just aft of the ribs, around a pulley at the front outer strut post, and up to a pulley on the under side of the upper ribbing. A steel connects the upper and lower struts.

Tail

The tail surfaces of the Oriole are used on the Orowing, slight modifications being made to the aileron parts. The fin is adjustable to balance the effect of engine torque, but the stabilizer is fixed.

The power plant is a Curtiss OX-5 engine delivering 90 hp. at 1400 r.p.m. Gasoline is fed to the carburetor from a 30 gal. gravity tank located in the first bay of the fuselage. A bypassing valve is mounted on top of the fuselage to allow gas to go to the engine and return directly to the upper wing. The carburetor leads, ignition wires, and gasoline ducts of oil are led forward from the pilot's cockpit inside the fuselage struts and made the lower section, where they are less liable to damage from the passengers' movements in and out of the plane.

Accommodation

There is a roomy passenger cockpit just aft of the gas tank and under the main panel and a pilot's cockpit immediately behind. The edges of both cockpit openings are upholstered, and physical lines are installed in both cockpits. Feet and back cushions are fitted to both seats. Weatherstrips are of rubber and completely protect the passengers and pilot from

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The Pitcairn Orowing three-seater (Curtis OX-5, 90 hp.)

When Writing to Advertisers, Please Mention AVIATION

American Soc. for Promotion of Aviation

By THOMAS L. HILL, President

IF THERE had never been a great war and a Royal Flying Corps of Canada, it is very probable that The American Society for Promotion of Aviation would not be in existence today. In 1915, we landed one, almost surely from the midges throughout the meeting, were assembled in Germany, New York, and sent to Canada, attached to the Royal Flying Corps for training. Arriving in Canada they found hundreds of other Americans, "former-flying" wearing the A.S.P.A. uniform. Groups of Americans, finding their ground school work at American colleges, were also sent for training, and the body, thus recruited, moved through Canada, Great Britain and on to France. The Frenchmen there found us the sort that only the great enemy and ignorance. After the War, through the effort of a member who had trained with this group, a party banquet was held to which many of the old gang returned for us moving to renew the old friendships and add a bit of "historic flying." It was from these party gatherings that the thought and spirit of the A.S.P.A. originated. In February, 1925, the A.S.P.A. was organized with the stated purpose of "increasing and maintaining interest in aviation, as our strongest aim of National Defense." It was planned to accomplish this work through the method of educational propaganda, knowing that when the general public was more conversant with the problems of aviation and its possibilities, the support necessary for its development would be secured.

Organized Many Talks

Conforming to this policy, the A.S.P.A. assigned one eighty talks upon the subject of aviation before clubs, societies and from radio stations in all parts of the country, during the year 1925. We have organized with the press in securing articles relative to aviation, and have been able to secure them upon many occasions. We have supported the idea of coordinating the country's air activities. We have co-operated with individuals and organizations in the laying out of landing fields in conjunction with this work. We have organized over fifteen hundred reports of towns and cities throughout the United States, concerning their work for a landing field in their community. The replies received indicate that the seed fell upon fertile soil.

Early this year, the President of the American Legion, fourteen years of age, and the World's youngest second pilot, to Washington. The boy was presented to President Coolidge and to the House of Representatives then in session.

The publicity created, resulted in the public hearing that aviation could be made a sport in which boys of no study age could participate. Plans for an educational flight through the States and West, under the auspices of Capt. R. W. French, were arranged by members of this society. Though plans were somewhat changed, Captain French and Lieutenant Smith, members of the A.S.P.A., not only made the flight, but by flying eight airplanes from St. Louis to the territory in the East, achieved publicity that resulted very favorably to the advancement of aviation. The flight was continued through New England. On one occasion sixteen passengers were carried. The thirty-five hour was well on this trip.

Instruction Plan

During 1925, opportunities have arisen, as have been created, which enabled members to appear before school assemblies and boys clubs, private talks on aviation. The response shows that a noticeable interest. An extensive report covering a pilot for the teaching of aviation at the New York schools has been prepared by members of the A.S.P.A. and submitted to interests who regard it favorably. One thousand dollars has been donated as a prize for the first boy or girl, under eighteen years of age, who flies from San Francisco to Boston, under rules of competition arranged by

this Society. Rules and regulations will be so arranged that every possible element of danger will be removed. The spectacle of a young young pilot making the flight will rate national publicity which cannot help but attract the attention of the youth of America to aviation as a sport. Additional prize money has been promised and it is likely that before the flight takes place, other offers will be made. The flight is scheduled for September, 1927.

Membership

Our membership covers a wide field. Members who have given their time to promote the work are too numerous to mention. Col. Harold E. Halsey, Capt. Arthur C. Brown, Capt. Hester Berry, Capt. Glenn K. Pike, Lieut. R. Noble Riley and Lieut. Robert R. Brown, by their talks over the radio, have done much to further the work of spreading aviation knowledge. One of our efforts looked toward the education of the younger generation in things aeronautical, was the arranging of a correspondence course in aviation. This is an arrangement of the Cardiacraft, Inc., sold in a simple understandable manner. The idea behind this course is to get material into the hands of the boys that will stir their interest so that they will seek further knowledge. The course is not only adaptable for boys and boys alone, but many persons who have had no previous contact with aviation have taken the course and have written of the value they received.

The plan of organization is for a National Headquarters, State Headquarters and local flights. The work has been all voluntary. The office space and telephone service has been the contribution of one of our members. General aviation has been educated upon in many countries. We have a membership charge of one dollar that goes to cover the cost of the silver wings worn by our members and the stationery, mailing and the other necessities of the work.

Alexander Increases Factory Space

The Alexander Aircraft Company, of Denver, Colo., is increasing its floor space by an addition of 7,000 sq. ft. The company has in course of construction another steel and concrete wall for the manufacture of Alexander Engines. Dr. George L. Bennett of Kansas City, Mo., has been added to the rapidly growing list of Blackhawk dealers. Dr. Bennett will represent the company in Western Missouri and Eastern Kansas.

French Airmen Make Record Flight

A ten hour distance top-top flight record was made on Oct. 20, when the French airmen, Cooke and Barnet, landed at Toulon in France. Starting from the Le Bourget airfield, the plane made the flight, a distance of 5,415 m., in 32 hr.

A Breguet in plane, equipped with a 500 hp. motor was used, and the route was via Strasbourg, Nancy, Constantinople, Aleppo and Damascus.

Captain Walter and Lieutenant Choules, of the French Army, in Sept. saw from Le Bourget in Breguet Albatros in 27 hr. a distance of 1,750 m., or the same distance between Beirut and Nis, Syria.

Godfrey L. Cabot Vice-President F.A.I.

The Washington office has been advised by cable of the appointment of Godfrey L. Cabot, President of the National Aeronautics Association, as Vice-President of the Fédération Aéronautique Internationale. The F.A.I. is the international sporting governing body for aeronautics and comprises the affiliation of twenty-five national aero clubs.



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Side Slips

by ARTHUR E. COOPER

The news that one of the proposed express companies will shortly establish an air express service, in conjunction with its railroad and truck services, certainly must have brought joy to the hearts of veteran baggage smuglers. Hereafter the baggage men's effectiveness has been limited to the height of six railroad cars and trucks from the station platform, a drop of about six feet was about the best he could do for a trunk or box. With the advent of the airplane one day between the possibilities will be almost unlimited and he will be able to select any article he wishes, according to apparent strength of the article to be delivered. We are tempted to guess to the joy of the veteran baggage men when he shows our several times, loaded with the inevitable clothing, over the side from what a blessed rest!

Doubtless it was in anticipation of the new express service that the manufacturers of numerous articles, furniture, glass and egg crates among them, have been endeavoring their well-advised series of experiments in dropping them from airplanes.

The aviation enthusiasts also have been worried that in terror at our mass aerials to be dropping oil, may be measured, for the Coast Guard is patrolling these treacherous places and some day, for instance over the backlogs, their attempt to measure liquid will be successful indeed. When the returners visit using high speed motor boats for their own

boats, and the government started building speed boats capable of catching them, there were stupid ones of the Coast Guardmen more in outcropping boats. The pilots all take even not any more gold cups either, in consequence the winners obtained permanent possession of not only the best and rapid, but the cover sides. The reason why government has long kept the navy-man was using warships in making his deliveries, seems to have some hints in fact, now that the government is getting airplanes on its feet. We predict a much increased interest in high speed planes on the part of some prominent "land slide" agents and "yes and no" officials (airmen) in the very near future. We also expect that the authorities will investigate thoroughly, anyone offering to keep the winning plane in the Behemoth, Capt. King.

You may remember that your attention was called to the competition between the State of California and Wisconsin, in forwarding the newspapers with loaded and undeveloped news items. California was organizing in secret, and finds in an attempt to steal some of Wisconsin's publicity for its flying and knowledge news. At the time we mentioned it California was one point ahead, having staged a mile with a train plane on the top wing of a plane in flight, and then, regarding the loss of a wheel from a landing gear in having a young lady climb into another plane to go down after the spare wheel. It may interest you to know that Wisconsin had the same with a former whose ground was so hard and rocky that he had to land on his back, however, and with a dog. California once again took, however, and it was one point ahead. According to the news from the region, parachute jumper at Santa Monica has had his plane in the landing gear of the plane from which he was jumping. "After the dusted in the air for two minutes as occupant of a second machine out the cord. Her chute opened and she landed safely two miles away."

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AIRPORTS AND AIRWAYS

Buffalo, N. Y.

With the Buffalo Airport in the course of development and the commercial possibilities of aviation becoming more apparent to local citizens, the feasibility of air transportation facilities has been studied by James H. Knapp, Jr., president of Grand Koeber Bros., with the result that no airplane has been put in commercial service between the chief Buffalo branches and the main office.



A Grand Koeber Bros. of the Buffalo Co.

Edith Tilden, of the local business engineering department, who is to be the chief pilot of the plane, piloted it from Detroit to Buffalo. The Knapp's plane was made in the Buffalo Verville Company of Detroit, is powered by a Chrysler and is of the light engine and passenger type, having six all metal members and instruments, with folding wings.

The trip from Detroit to Buffalo was made in 2 hr., 36 min. In the first commercial flight, the plane delivered a letter en route to a Cleveland, Ohio, bank, making delivery in 3 hr.

Pittsburgh, Pa.

By Ray A. Tucker

The Aero Club of Pittsburgh recently held in its Club House at Rodgers Field, a well attended dinner party in honor of Capt. Lloyd D. Lee, U.S. Army Air Corps, Air Officer of the 26th Division, U.S. Army Reserve and Commanding Officer of Air Corps Reserve Flying at Rodgers Field, the Pittsburgh Municipal Airport. It also served as an occasion for the Club to welcome Lieutenant Lee's marriage, Capt. Thomas H. Van, U.S. Army Air Corps, who has been transferred to Pittsburgh following a three year tour of duty in the Panama Canal Zone. Lieutenant Lee is to report for duty at the Advanced Flying School at Kelly Field, Tex. Dole, after expressing pleasure, words of praise, presented Lieutenant Lee with a wreath with in behalf of the Reserve Officers.

Ben Hurber, president of the club, then followed, with additional remarks to the Lieutenant Lee's character, ability, and popularity and the club's regret that he was leaving Pittsburgh, but wishing him success and happiness in his new assignment. Hurber, on behalf of the club then presented Lieutenant Lee with an Imperial silver clock set and plates, a gift which Ben Lee could equally enjoy.

The members then voted and presented Lieutenant Lee with a resolution from the club which was beautifully hand-printed.

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on stage's skin, and hear the star's self. The production was made for the faithful and regular members in which he had distinguished his duties as an officer of the 98th Division and Commanding Officer of Hudson Field. By the resolution, as was also elected as honorary life member of the Army Club of Pittsburgh, and the thanks of the club were extended to him for all that he had so generously done to further its interests.

Lieutenant Lea was surprised and made apparently happy to be the recipient of these gifts and expressions of friendship from his friends. Following such presentation he expressed his thanks and delight to being so honored, and his regrets at leaving Pittsburgh, which held so many memories and friendships.

Major E. L. Henry, Capt. Van and Bob Hancock followed with expressions of tribute to Lieutenant Lea. (It is reported that Bob Hancock spent a week writing his poems, but he only took two minutes to read it. It was a masterpiece, as it contained not a single run-word, all of which repeat its for Lea.)

On Nov. 4, the Army Club had the pleasure of entertaining and honoring Commander Byrd in its regular weekly luncheon in the Chamber of Commerce dining room. During the noon, the Commander Byrd was awarded a reception by the Mayor and committee members. He was presented with the new polished aluminum winged star emblem insignia which the club has just adopted for use by the members and complimented the officers on his method of administering the Club and the presentation of local organizations.

Old Guard G. F. Foy, Jr. has just purchased a new plane known as a Dayton-Wright "Clancy" with an OX 5 Motor. It is to be used for his own personal pleasure and he is keeping it at E. J. J. Field.

Boston, Mass.

By Daniel Redburn

Major Charles H. Wootley, of the Massachusetts National Guard Air Service, spoke before the November meeting of the Boston Chapter, W.A.A., that the present Boston Airport had been purchased by the city of Boston from the state, and

developed as a municipal enterprise. He defined the present municipal situation to the proper development of the airport, due to the fact that the state, partly on account, the city, can not readily spend money on land owned by the state. The state will not appropriate money. And there the matter.

An enthusiastic dinner gathering of some fifty men, including the eighth annual American night supper of the Aviation Club of Boston at the Harvard Club. The Aviation Club has only the new building each year and limits its membership strictly to men who flew over the line during the World War. Garrison H. Foss is chairman of the committee, Charles E. Coleman, treasurer, and Paul F. J. J. secretary.

The Boston Meeting Air Guard will meet at Temple Hotel November 22nd to consider the question of lighting the Boston Airport for night flying.

Flying in Boston the past week totaled 24 hr. for the Army, 14 hr. for the Navy, 21 hr. for the National Guard and 24 hr. for commercial pilots.

U. S. Air Forces

Assistant Secretary on Tour of Inspection

Assistant Secretary of War Lieut. Colonel F. T. Drake, Distinguished Service Cross, was on tour of inspection, attended the examination held Nov. 8 at New Orleans for the dedication of the new Orleans Airport. Secretary Drake was a speaker at the banquet held in the evening at the Commodore Hotel and left the next morning for San Antonio, where he remained until Nov. 18, inspecting the Air Corps activities at Kelly Field, Brooks Field and Fort Sam Houston. His itinerary

also included the inspection of Fort Crockett, California. Secretary Drake returned to Washington Nov. 21.

Army Air Mechanics Examination Instructions

Instructions to govern the examination and classification of enlisted men as air mechanics have been issued by the War Department, to the effect that no enlisted man will be rated as an air mechanic until he has been examined for the purpose.

Examinations for the rating of air mechanics, first class, and an instructor, second class, will be held at such times and places as the exigencies of the service require. Examinations will be held in enlisted personnel of the Air Corps, who shall be examined in writing, in and on memorandum, by their respective organization commanders. The examinations will be conducted by boards composed of officers of experience in the Air Corps and shall be conducted previously of these officers except when it is readily impracticable to assemble that number. Examining boards will be composed by men including officers of Air Corps stations, commanding officers of Air Corps units larger than a squadron, or by the commanding officers of Air Corps troops at other than Air Corps stations.

Referrals will be granted only to enlisted men who have demonstrated their fitness and have shown that they possess the necessary technical qualifications therefor, and are released from the corps performing thereto. When an enlisted man holding a rating as an air mechanic vacates on the day following the date of his discharge, his rating will be continued in force.

The rating of air mechanics, first class, will be given only to those men who have completed three years' service in the Air Corps except those who have successfully completed a prescribed course at an Air Corps special service school and those who have served as commissioned officers of the Air Corps of the Army of the United States.

The rating of air mechanics, second class, will be given only to those men who have completed two years' service in the Air Corps or have specially qualified.

Examinations for air mechanic ratings will be both theoretical and practical. The theoretical examination will consist of such questions as are considered necessary to show that the candidate's practical knowledge is based on correct theoretical information. The Chief of the Air Corps will, from time to time, prescribe the scope of these examinations.

Airplane Short Wave Radio Sets

An important activity of the Radio section of the Signal Corps of the Army has been the development of radio equipment both transmitting and receiving, for use in Army airplanes. With the space so limited and the need for an increase of economical sets, which would fill all requirements. However, lack of space and the necessity for minimum weight, combined with the constantly increasing demands which air planes do, from their home stations, have made the problem difficult.

The recent discovery of the possibilities of short-wave transmission and reception has opened an avenue of progress in this problem. However, while the short-wave sets have shown some remarkable results in permanent ground stations, these adaptations to airplane use in still not entirely satisfactory. The short-wave sets meet the requirements as to space and weight, but the performance of the short-wave is sometimes extremely erratic.

Certain wave lengths are suitable for certain distances. Again, wave lengths found suitable for certain distances at one station were found entirely unsuitable for the same distances at another. There is also the phenomenon known as radio waves on the "skip distance" effect. Although the Signal Corps has gathered sufficient data for a working basis of short-wave airplane sets, before improved reliability will develop many developing distances.

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PUBLISHER'S NEWS LETTER

When a complaint is received by a publisher or there is criticism of any policy advocated by the publication it should receive the most courteous attention. This page has often been used to reply to critics. Usually, their remarks are not given and their comments are treated in spirit of those that may be in the minds of other readers. We have even been called to account by those who have written for not printing their names, as they feared that they might be thought to have made an anonymous comment. For the first time it proved upon a letter of this kind has been received that will be replied to, not because it is a personal criticism but on account of the opportunity it presents to clear away any misapprehension as to the stand this paper has taken on the subject of aircraft legislation.

The writer of the letter who is critically a very careful reader of AVIATION quotes an address made in London before the Society of British Aircraft Constructors during which the publisher of AVIATION and that British aircraft would be used with confidence because they were built "under the rigid inspection of the Air Ministry". He then quotes a statement made in September on this page that "AVIATION has always believed in the most simplified and least form of regulation, while maintaining it to a minimum state. The experience of England with drastic regulatory measures has produced a deplorable condition. This country will do well to learn from the experience of other nations that from any action that may tend to be or lack air development when hopes are so high."

First, let the statement made in London be considered. Then, the Air Ministry concludes not only aircraft, engines and the airport facilities but the pilot and the mechanic as well. But they also provide the subsidies that make the British an less possible which makes the situation very different from that in the United States. If the one day pays makes demands that appear severe and costly, it is only a matter that concerns the state treasury. The question of cost of operation does not have to be considered from a commercial standpoint. It is not too much to say that away of the air line of Europe would be operated without a subsidy if the drastic restrictions that they operate under were true cost. The British air regulations have been in extremely severe that the cost of aircraft as well as their operation has been greatly increased. They have almost wiped out what was once aerial service. The great development of light aircraft which has been in construction has been limited by excessive prices by the Air Ministry. The

schools for these instructors have been largely supported by the government. It will therefore be evident that the conditions that exist in England can hardly be applied to those in the United States. And it is a very true statement that a sense of great necessity is felt by all who travel on the English aircraft because the supervision of their construction has been very strict.

Now turn to the situation in this country. So far as our memory goes there has never been in this column any advocacy of breast inspection of aircraft that are to carry passengers. We have felt that the manufacturers of transport planes were to be asked only, if only for selfish business reasons, to make their planes as safe as possible. We hope and believe that the regulations for aircraft in this country will be such that it will not be necessary to make the jobs that has to be charged for aircraft for commercial purposes so high that they cannot be operated with a profit. If the government were subsidizing commercial aviation, then it would demand that the strictest kind of regulation be prescribed.

But grant, for the sake of the next point, that no government inspection or operation regulation can be too strict for the passenger carrying planes. Consider what would happen to those companies that are operating aerial service enterprises if the same requirements were made applicable to both the standard demanded by the Government and as strict as it is, should the cost of commercial planes for aerial service would increase to a point where they would become unprofitable to operate. In addition to this, if the qualification of pilots and the maintenance of all airplanes become severe, the expense would become so prohibitive that this promising branch of our development would be almost extinguished. The one great difference between the aerial development in this country and Europe is that here aerial aviation has spread to hundreds of cities, whereas abroad it is only seen to a very limited extent.

We hope that we have explained what may have appeared to be an inconsistency. If those who have strict regulations would talk to manufacturers and operators abroad—those who have left the handling of their detailed operation vision—they would soon reach the conclusion that the less regulation the better while the art is in an experimental state. We are glad to observe that the manufacturers and operators were practically unanimous in asking that the Bureau of Commerce regulations be revised, changed and passed rather than detailed and strict—L.D.G.

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